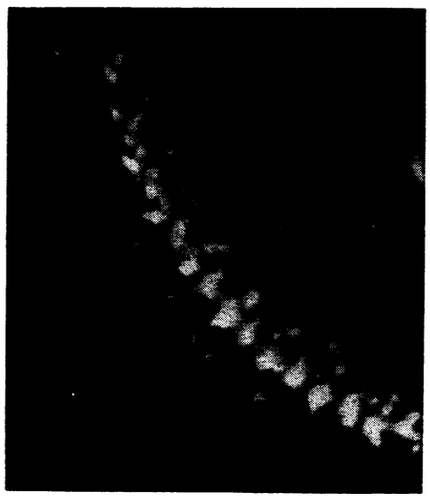

Grain plankton viewed from Franklin.

the shoreline farther away from the main land mass.

Numerous other scientific studies were carried out during the mission. Dr. Piccard was particularly interested in bioluminescence, the natural light given off by some forms of life, as well as any fluorescent minerals that might affect the undersea light level. The Naval Oceanographic Office made repeated salinity, temperature, density and other measurements in conjunction with simultaneous airborne measurements by the Navy's Anti-Submarine Warfare Environmental Prediction Service. Other Navy research included visual and acoustic studies of the sea floor in an effort to understand the phenomenon known to sonar operators as bottom loss, which shows itself when sound pulses sent out from a ship or submarine mysteriously fail to return, presumably due to absorption by the bottom.

The experiment by NASA was a detailed one, with medical and psychological investigations including eight different kinds of psychological tests before and after the mission. Bacterial counts, air and water freshness measurements and even the applicability of the submarine's design features to a spacecraft were all on the agenda.

Meanwhile, the two surface ships, the Privateer and the Kellar, were taking measurements of their own, as well as samples for later analysis in laboratories ashore, all to be correlated with data from the Ben Franklin. In addition, the USS Lynch gathered surface data from as much as 60 miles ahead of the submarine's path. The data could aid in determining the stability of conditions in the little-known current.

As is usual in explorations of a new frontier, the Gulf Stream drift raised as many questions as it answered, if not more. "The true impact of this mission on oceanography," says Piccard, "is still to be determined." <>

SENATE ACTION

Defense research takes its licks

"It goes up so fast that I cannot follow it," says Senator J. W. Fulbright (D-Ark.), speaking of the Defense Department budget. "However, $80 billion is what is proposed to be spent (in fiscal year 1970). This amounts to about 60 percent of the total budget when social security and all the other trust funds are not included."

About a tenth of the $80 billion, $8.227 billion, was requested for research, development, testing and evaluation; the request is contained in a military procurement bill now before the Senate.

Items under this heading are drawing especial fire from Fulbright and other senators this year—as they did last—because it is here that the critics feel they can convict the Defense Department of overstepping its bounds. It supports research it has no business bothering with, they say, research that could better be administered by other agencies.

As a result of last year's battle, the Pentagon announced that it would begin to divest itself of responsibility for various kinds of basic research that seemed far from its mission (SN: 2/10/68, p. 134). This year, testifying before the Senate Armed Services Committee, Dr. John S. Foster Jr., director of defense research and engineering, cited, as examples of the department's present basic research interests, global thunderstorm studies, high-temperature lubricants and ultrashort laser pulses. These are a long way from the particle physics and radio astronomy that the department used to take pride in.

Nevertheless the committee trimmed the budget request by a billion dollars to $7.18 billion. This is about $400 million less than fiscal 1969's $7.551 billion.

In that form the bill went to the floor, where several senators also had scissors out.

The bill as approved by the committee included a $100 million emergency fund that the secretary of defense could spend at his discretion for contingencies. A bipartisan group of senators introduced an amendment to cut this fund to $50 million. The argument against the fund was that the secretary had used such money for items related to the Vietnam war in the past and was likely to do so in the future. A compromise left the emergency fund at $75 million.

Then came Fulbright with an amendment to trim $45 million more from other items in the research and development budget, namely: 10 percent or $27 million from Federal Contract Research Centers, one-third or $2 million from research in foreign countries, 20 percent or $5 million from counterinsurgency research, $3 million from other social science research and 25 percent or $8 million from project Themis, by which the Department of Defense tries to build up the capabilities of science departments in various universities.

In debate before passage of the Fulbright amendment Sen. William W. Proxmire (D-Wis.) expressed concern that the Department of Defense was being given more money to support research than the National Science Foundation. "The problem is," he said, "that whereas we have established a Science Foundation for the purpose of making the inquiries and making this research . . . on behalf of all the agencies of Government, we provide the Department of Defense with six to seven times as much as we provide for the National Science Foundation."

Earlier in the week the Senate took a blow at research in an area that belongs in Defense if it belongs anywhere: chemical and biological warfare. Some $16 million for research and development on offensive CBW weapons and agents was cut out of the budget in committee in the aftermath of heavy controversy (SN: 7/26, p. 80) and the Senate passed an amendment banning open-air tests of lethal chemical and biological agents unless the secretary of defense determined that national security demanded them.

The bill was still under debate when the Senate recessed on Aug. 13.

PATENT LAW

The more things change . . .

Basically unchanged since 1836, the U.S. patent system is staggering under a growing mountain of patent applications. The result is an average wait of two and a half years before a patent is granted.

Through the years, of course, there have been cries for sweeping reform. In 1965, the Johnson Administration set up the President's Commission on the Patent System, which urged complete revision. Senate and House bills flourished in response to the report, only to die in committee (SN: 2/4/67, p. 114). Now, in 1969, a new champion enters the lists with every likelihood of passage. But the new bill represents conservatism rather than revisionism and will have no substantial effect on the backlog problem.

Introduced by Sen. John L. McClel-